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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Norihisa Miyoshi

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EXAMINER

MERKLING, MATTHEW J

ART UNIT

PAPER NUMBER

1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/568,500	Applicant(s) MIYOSHI ET AL.	
	Examiner MATTHEW J. MERKLING	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/16/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group II (claims 8-22) in the reply filed on 8/26/09 is acknowledged.

Claim Rejections - 35 USC § 102

- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
 3. Claims 8, 17 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyoshi (WO 99/31202 with English language equivalent US 2005/0144844).

Regarding claims 8 and 17, Miyoshi discloses a method and apparatus of treating an organic matter (paragraph 2), comprising the steps of:

supplying an organic matter (such as coal, paragraph 2) to a gasification chamber (see Fig. 14 where fuel is introduced into gasification chamber 1);

gasifying the organic matter (paragraph 16) to produce a combustible gas (see outlet 121 of combustible gas from gasification chamber 1) and residue (such as char, paragraph 16) in said gasification chamber;

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combusting the residue (char) produced in said gasification chamber in a combustion chamber (2, see Fig. 14) to produce a combustion gas (see Fig. 14, combustion gas outlet 124 from combustion chamber 2); and

introducing the combustible gas (via conduit 123) produced in said gasification chamber into a gas engine or a gas turbine (106) to recover power (paragraph 25);

wherein said gasification chamber (1) and said combustion chamber (2) are provided in an internally circulating fluidized-bed gasification furnace (see internally circulating fluidized bed 10 in Fig. 14), and a bed material is circulated between said gasification chamber and said combustion chamber (such as silica sand/fluidizing medium, paragraph 55).

Regarding limitations recited in claim 22 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP §2114 and 2115. Further, process limitations do not have a patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states “Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 9-12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyoshi (WO 99/31202 with English language equivalent US 2005/0144844) as applied to claims 8 and 17 above, and further in view of Mulholland (US 4,429,643).

Regarding claims 9, 18 and 16, Miyoshi discloses a method in which an organic material is oxidized and where a combustion gas is produced (as discussed above in claim 8), but does not go into specifics as to how said organic material (such as municipal waste, or sewage) is dried. In other words, Miyoshi fails to disclose a heat exchange between the combustible gas produced in said gasification chamber, the combustion gas produced in said combustion chamber and an exhaust gas from said gas engine or said gas turbine, and air is carried out to recover sensible heat from these gases, and the air heated by the heat recovery is used as drying air for drying the organic matter.

Mulholland also discloses a process in which organic material is treated and sent to a oxidation reactor (see abstract).

Mulholland teaches a drier (12) that is used to dry the organic material prior to introduction into a conversion reactor (80) wherein the drier utilizes hot air to heat and dry the organic material (hot air enters through conduit 120A). This heated air obtains its heat via heat exchange with a combustion reaction of the organic material (the combustion takes place in combustion reactor 80). Mulholland teaches such a process in order to ensure the proper 'wetness' of the biomass/organic material for thermal decomposition/combustion (col. 1 lines 11-25).

As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to dry the organic material of Miyoshi with a heated air stream that is heat exchanged with the exothermic processes (such as the combustible gas, combustion gas, and exhaust gas) of Miyoshi (as taught by Mulholland) in order to ensure the proper wetness of the sludge/organic material/biomass that is processed in the thermal decomposition/combustion furnace.

In addition, Miyoshi, as modified by Mulholland, discloses all of the claim limitations as set forth above, but modified Miyoshi does not explicitly disclose the amount of fuel supplied to said gas engine or said gas turbine is adjusted so that the sum of the amount of thermal energy recovered from the combustible gas and/or the combustion gas that is produced from said internally circulating fluidized-bed gasification furnace and the amount of thermal energy recovered from an exhaust gas discharged from said gas engine or said gas turbine is equal to or higher than the amount of thermal energy that is required to dry the organic matter. In other words, modified Miyoshi does not explicitly disclose varying the fuel input to the turbine such that the energy gained by heat exchange with

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the hot exhaust gases mentioned above is equal to the amount of energy needed to dry the organic waste. However, varying of the fuel to the turbine to achieve the correct heat exchange of the drying gas with the exhaust gas to equal that needed by the drying is not considered to confer patentability to the claims. As the heat exchanged between two gas stream is variable that can be modified by adjusting the gas flow rate of one of the streams (such as the exhaust gas stream from the turbine), the precise fuel rate to the turbine would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed modification of the fuel stream to the turbine cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the heat exchange between the exhaust streams and drying air streams of modified Miyoshi by varying the amount of hot exhaust gases exiting in the turbine to obtain the desired heat of drying gas that is required to dry the organic material of modified Miyoshi (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)). Since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

Regarding claims 10 and 19, Miyoshi, as modified by Mulholland above, teaches the drying air (going through conduit 120A of Mulholland) used for drying the organic matter is heated by a heat exchange between the drying air, and the combustible gas, the combustion gas and the exhaust gas (all the exhaust gases from exothermic processes of Miyoshi). However, as modified above, Miyoshi does not disclose that the drying air is

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circulated again for use as the drying air, and part of the drying air which is circulated is introduced into said internally circulating fluidized-bed gasification furnace and is deodorized therein.

Mulholland teaches recycling the drying air in order to prevent the odorous drying air from being released into the atmosphere (col. 2 lines 46-53) as well as sending a portion of the drying air into the furnace in order to eliminate the noxious and odorous gas and prepare it for release into the atmosphere (col. 2 lines 50-62).

As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to recycle the drying air of modified Miyoshi, as well as send a portion of the drying gas of modified Miyoshi to the furnace/combustion chamber, as taught by Mulholland, in order to prevent the odorous drying air from being released into the atmosphere.

Regarding claims 11, 12 and 20, Miyoshi, as modified above, teaches a drying air with a water content (after emission from the dryer, the drying gas contains a high level of moisture). However, Miyoshi, as modified above, does not explicitly disclose a water content in the drying air used for drying the organic matter is condensed away by a direct heat exchange between the drying air and cooling water to lower the rate of the water content in the drying air.

Muholland teaches sending the drying gas (via conduit 49) to a condenser (venturi scrubber 54) which condenses and cools the excess water vapor in the drying gas stream in order to eliminate water vapor for proper operation of the furnace (col. 7 lines 57-63).

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As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the water condensing scrubber of Mulholland, to the method of Miyoshi, in order to eliminate water vapor for proper operation of the furnace.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyoshi (WO 99/31202 with English language equivalent US 2005/0144844) and Mulholland (US 4,429,643) as applied to claim 11 above, and further in view of Mitsuo (JP 54-096864 A1, along with JPO English Abstract of same document).

Regarding claim 13, Miyoshi, as modified above, teaches a scrubber/condenser for the drying gas, but does not explicitly disclose that the scrubber is fed with wastewater from a sewage drain.

Mitsuo also discloses an apparatus and method in which an organic material is dried with a heated air stream (see abstract).

Mitsuo teaches condensing water in an exhaust stream from a dryer (1) using a scrubber (11) which is fed with wastewater (17) from a sewage facility.

As such, modifying the apparatus and process of modified Miyoshi, such that the water used for the condenser/scribber is obtained from a sewage drain (as taught by Mitsuo) is nothing more than a simple substitution of one known element for another to obtain predictable results and would have been obvious to one of ordinary skill in the art at the time of the invention.

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8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyoshi (WO 99/31202 with English language equivalent US 2005/0144844) as applied to claim 8 above, and further in view of Frumerman et al. (US 4,175,929).

Regarding claim 14, Miyoshi discloses an apparatus and method which produces a combustible gas (evolving from said gasification chamber) which is eventually fed to a gas engine/gas turbine (as discussed above). However, Miyoshi fails to teach a scrubber is provided for cleaning the combustible gas supplied from said gasification chamber, and a temperature-lowering and dust-removing apparatus is provided upstream of said scrubber, whereby the combustible gas is treated by said temperature-lowering and dust-removing apparatus to lower a temperature of the combustible gas to a value ranging from 150°C to 250°C for condensing tar in the combustible gas and to remove dust from the combustible gas, and then the combustible gas is charged into said scrubber.

Frumerman also discloses a gasification apparatus and method in which the combustible gas produced in a gasifier and subsequently cleaned (see abstract).

Frumerman teaches utilizing a first temperature-lowering and dust removing apparatus (first gas scrubber 18 and cyclone separator col. 3 lines 31-36) in order to remove particulates and condense the tars in the combustible gas stream/producer gas and reducing the temperature of the combustible gas down to 100-340°C (col. 3 lines 16-30) and then sending the combustible gas stream/producer gas to a scrubber (second gas scrubber 26) in order to remove the non-aqueous contaminants from the combustible gas/producer gas (col. 3 lines 41-54).

As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the temperature-lowering and dust removing apparatus and method and the scrubber apparatus and method of Frummerman to the apparatus and method of Miyoshi in order to remove particulates and condense the tars in the combustible gas stream/producer gas as well as to remove the non-aqueous contaminants from the combustible gas/producer gas.

Furthermore, while Miyoshi, as modified above, does not explicitly state a temperature of the gas coming from the temperature-lowering/dust removing apparatus to be 150°C to 250°C, modified Miyoshi does teach a temperature range (100-340°C) that encompasses this range and it would have been obvious to one of ordinary skill in the art to vary the temperature of the combustible gas exiting the temperature-lowering/dust removing apparatus to find the optimum working temperature of said gas.

9. Claims 15 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyoshi (WO 99/31202 with English language equivalent US 2005/0144844) as applied to claims 8 and 17 above, and further in view of Titus et al. (US 6,215,678).

Regarding claims 15 and 21, Miyoshi teaches generating a combustible gas and eventually feeding said combustible gas to a turbine in order to produce electricity.

However, Miyoshi fails to teach a fuel comprising natural gas, town gas, propane gas, gasoline, kerosine, gas oil, or a heavy oil is supplied as an auxiliary fuel or a main fuel to said gas engine or said gas turbine.

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Titus also discloses a combustible gas generating process and apparatus which is sent to a turbine to produce electricity (see abstract).

Titus teaches utilizing an auxiliary fuel (such as natural gas, col. 3 lines 36-41) in the gas turbine/combustor (49) in order to operate said turbine during periods where combustible gas is not being generated (such as during startup, col. 12 lines 14-19).

As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the auxiliary fuel of Titus to the method of Miyoshi in order to operate said turbine during periods where combustible gas is not being generated.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J. MERKLING whose telephone number is (571)272-9813. The examiner can normally be reached on M-F 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. J. M./
Examiner, Art Unit 1795

/Benjamin L. Utech/
Primary Examiner